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17 ) 20 23 - 79 ( 55 ) 16 , 20 10 . 6

10 - 15 IU 175 - 1000 IU( 484 IU) 25 - 115 ( 64 ) 16 (62%) 10 5 (19%) 81% 5

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PTS (8 - 10).

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6 - Fr. side arm sheath sheath  
5 - Fr.  
(5 - Fr. multi - sideport catheter infusion set, Cook,  
Bloomington, In) ( , )  
10 - 15 IU  
100 ml  
175 - 1000 IU( 484  
IU) 25 - 115 ( 64 )  
5 IU  
12  
partial prothromboplastin time(PTT) thrombin time(TT)  
PTT 75 - 100 , TT 60  
. 12 - 24  
가 8 - 14 mm  
10 - 14 mm (Wal -  
lstents, Schneider, Switzerland)  
1

**Table 1.** Locations of Thrombus (n = 26)

Location of thrombus	No	Percentage
Popliteal and femoral vein	3	12
Femoral and iliac vein	18	69
Femoral and iliac vein, IVC	5	19

**Table 2.** Risk Factors for Deep Venous Thrombosis (n = 26)

Risk Factors	No	Percentage
May-Thurner syndrome	5	19
Recurrent DVT	4	15
Recent surgery	4	15
Recent trauma	2	8
Prolonged bed rest	2	8
Pregnancy	2	8
Bechet 's disease	2	8
Hypercoagulable disorder	1	4
No risk factor	4	15

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**Table 3.** Complications of Catheter-directed Thrombolysis in Deep Venous Thrombosis (n = 23)

Complications	No	Percentage
Major (2 / 23 = 9%)		
Suspected pulmonary emboli	1	4
Intramural hemorrhage in colon and multiorgan failure	1	4
Minor (6 / 23 = 26%)		
Hematuria	3	13
Hematoma in puncture site	1	4
Gingival bleeding	1	4
Hemoptysis	1	4

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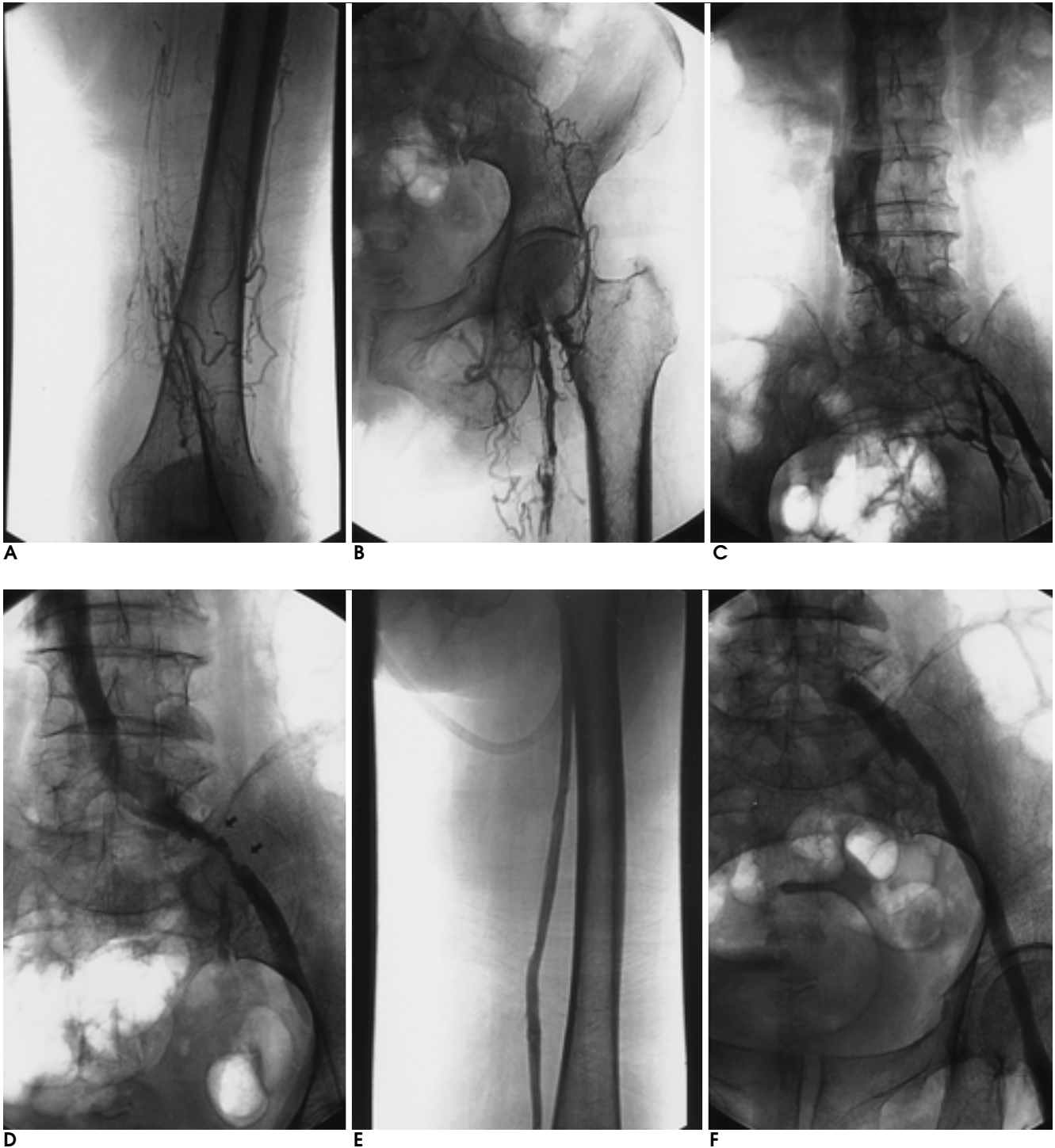
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(Table 3).



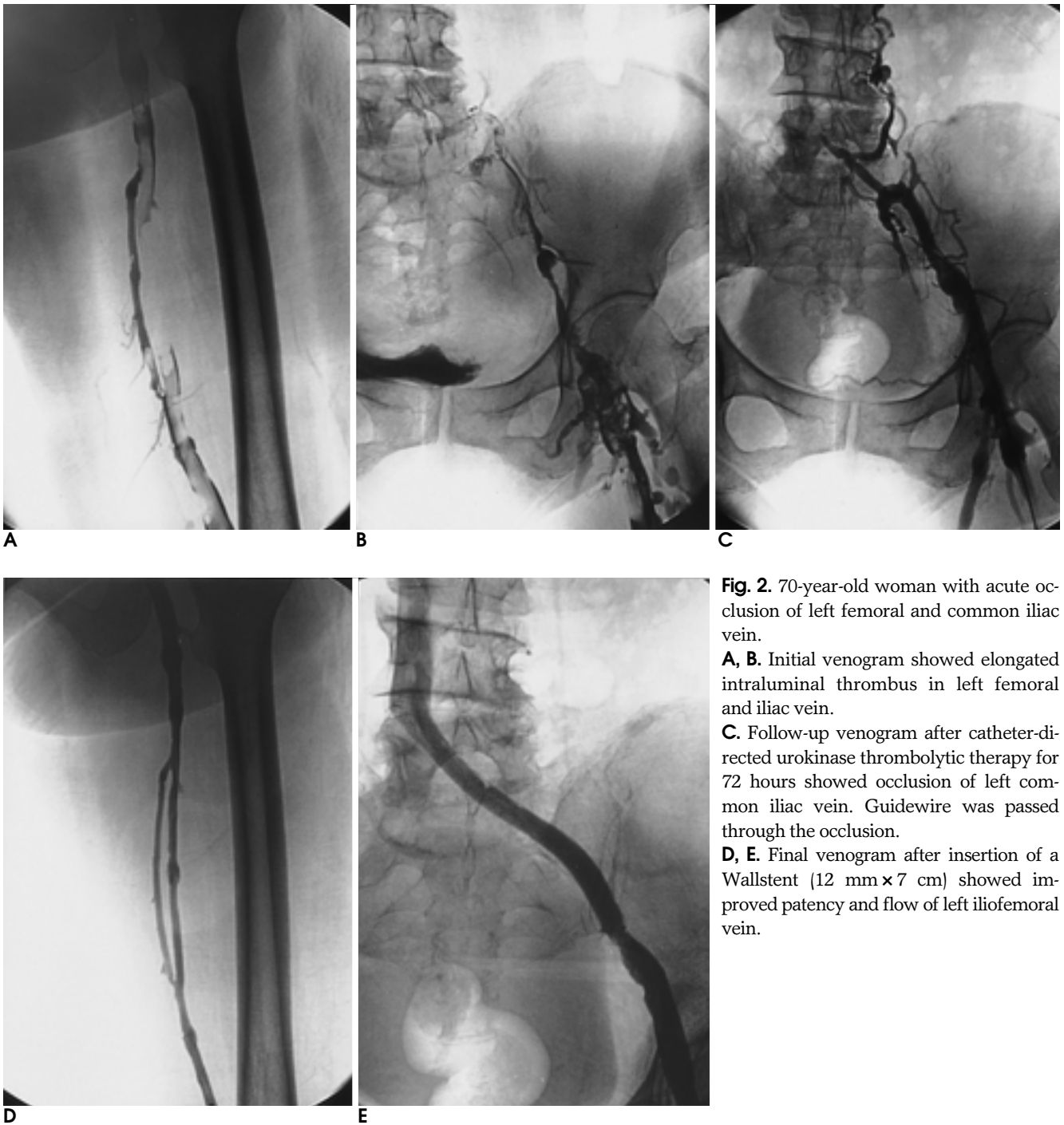
**Fig. 1.** 66-year-old woman with acute DVT with stenosis of left iliac vein.

**A, B.** Initial venogram showed occlusion of iliofemoral vein with multiple collaterals.

**C.** Venogram after catheter-directed urokinase thrombolytic therapy for 24 hours shows residual thrombus in left iliac vein and inferior vena cava.

**D.** After 29 hours of urokinase therapy, venogram showed complete lysis and focal stenosis of left iliac veins (arrows) which was dilated with a 12-mm balloon catheter .

**E, F.** Final venogram showed patency of iliofemoral vein with mild residual iliac stenosis.



**Fig. 2.** 70-year-old woman with acute occlusion of left femoral and common iliac vein.  
**A, B.** Initial venogram showed elongated intraluminal thrombus in left femoral and iliac vein.  
**C.** Follow-up venogram after catheter-directed urokinase thrombolytic therapy for 72 hours showed occlusion of left common iliac vein. Guidewire was passed through the occlusion.  
**D, E.** Final venogram after insertion of a Wallstent (12 mm × 7 cm) showed improved patency and flow of left iliofemoral vein.

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## Deep Venous Thrombosis in the Lower Extremity: Catheter-Directed Thrombolysis<sup>1</sup>

Byung-Suk Roh, M.D., En-A Kim, M.D., Ki-Han Park, M.D., Kwon-Ha Yoon, M.D.,  
Byung-Jun So, M.D.<sup>2</sup>, Seon-Kwan Juhng, M.D., Jin-Jong Won, M.D.

<sup>1</sup>Department of Radiology, Wonkwang University School of Medicine

<sup>2</sup>Department of Surgery, Wonkwang University School of Medicine

**Purpose:** To evaluate the efficacy of catheter-directed thrombolysis in treating symptomatic deep venous thrombosis (DVT) in lower limbs.

**Materials and Methods:** Twenty-six consecutive patients (16 male and 10 female; mean age, 55 years) with lower extremity DVT underwent thrombolytic therapy. The duration of symptoms was 1 - 90 (mean, 17) days: 20 days or less in 16 cases (acute DVT) and less than 20 days in ten (chronic DVT). Catheter-directed infusions of urokinase were administered via ipsilateral popliteal veins, and angioplasty or stent placement was performed after the thrombolytic procedure. Oral medication of warfarin continued for six months, and for the evaluation of venous patency, follow-up ultrasonography was performed. The total dose of infused urokinase was 1,750,000 - 10,000,000 (mean 4, 84,000) IU, and the total procedural time was 25 - 115 (mean, 64) hours.

**Results:** Lysis was complete in 16 cases (62%, all acute DVT), partial in five (19%, chronic DVT), and failed in five (19%, chronic DVT). Eight patients with venous stenosis and two with occlusion were treated by means of angioplasty (n=4) or Wallstent placement (n=6). Minor bleeding occurred in six cases and major complications in two (one of pulmonary embolism, and one of multiorgan failure).

**Conclusion:** Catheter-directed thrombolysis with urokinase is effective for the treatment of DVT in lower limbs.

**Index words :** Thrombosis, venous  
Thrombolysis  
Veins, stenosis or obstruction  
Veins, interventional procedures

Address reprint requests to : Byung-Suk Roh, M.D., Department of Radiology, Wonkwang University Hospital  
344-2 Shinyong-dong, Iksan, Chonbuk 570-711, Korea.  
Tel. 82-63-850-1513 Fax. 82-63-851-4749 E-mail: bsroh@wmc.wonkwang.ac.kr

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: 121 - 8 ( ) 137 - 130

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